

REMARKS

Applicants respectfully request entry of the above amendment. By the above amendment, claims 1, 11-14, 16, and 17 have been amended; and claims 8 and 9 have been canceled. Applicants note that no new matter has been added. Upon entry of the amendment, claims 1-7 and 10-17 are pending.

RESPONSE TO THE OFFICE ACTION

Preliminary Matters

As a preliminary matter, Applicants thank the Examiner for a telephone conversation on April 11, 2008 with Dr. Thomas Weber regarding the status of the Office Action. During the telephone conversation, it was clarified that the status of the present Office Action is non-final and not final as indicated on the Office Action Summary Sheet. In support of this result, the Examiner indicated that the Office Action is listed as Non-Final on the Transaction History Sheet on PAIR and that the indication on the Summary Sheet was an inadvertent error. Therefore, this paper is prepared in response to a Non-Final Office Action.

Claim Rejections under 35 U.S.C. § 103(a)

The Office Action raises the following 35 U.S.C. § 103(a) rejections:

- (a) Claims 1-5, 7, 8, 11-15, and 17 are rejected under 35 U.S.C. § 103(a) as allegedly unpatentable over JP 2001-164354 to Harada ("Harada") in view of U.S. Patent Application Publication No. 2004/0013911 A1 to Maeda ("Maeda") and in further view of Mat. Res. Bul., vol. 16, pp.453-459, 1981 by Y. Tsukuda ("Tsukuda");
- (b) Claims 6 and 16 are rejected under 35 U.S.C. § 103(a) as allegedly unpatentable over U.S. Patent No. 5,004,712 to Borglum ("Borglum"), and further evidenced by JP 59096273 to Hidekazu et al. ("Hidekazu") and JP

- 61104062 to Takeshi et al. ("Takeshi"), in further view of U.S. Patent No. 5,057,335 to Hanagata et al. ("Hanagata");
- (c) Claims 9 and 10 are rejected under 35 U.S.C. § 103(a) as allegedly unpatentable over Harada in view of Maeda and Tsukuda, as in claim 8, and in further evidence of U.S. Patent No. 5,024,992 to Morris ("Morris").

Prior to addressing each and every rejection, Applicants respectfully submit the following analysis of the present application and the cited references:

The present application relates to a Y_2O_3 spray-coated member and method for preparing the same wherein the vicinity of the surface of Y_2O_3 spray coating having a porosity larger than that of a sintered body is fused by electron beam irradiation and then the fused portion is densified and blackened.

The method of the present inventions does not use hydrogen gas.

Harada discloses Y_2O_3 spray coating, wherein the top coat is formed by a plasma spraying process at atmospheric or reduced pressure. However, Harada is silent regarding the color in the appearance of Y_2O_3 spray coating. Additionally, Harada does not include or suggest any blackening and/or densification by a secondary treatment such as electron beam irradiation or laser beam irradiation.

Maeda discloses a technique wherein, in order to give a color tone to a spray coating of a rare earth oxide such as Y_2O_3 , another material, i.e., carbon, titanium, molybdenum or the like is added to the spray coating material followed by an atmospheric plasma spraying to obtain a colored Y_2O_3 coating. Therefore, the resulting color is caused by the added material while the actual color of Y_2O_3 does not change.

Tsukuda discloses a blackening technique for Y_2O_3 sintered bodies, wherein the colorless sintered body is heated and blackened from thermal composition of yttrium oxalate in a reducing hydrogen atmosphere at 2373-2573 K for 30 to 120 minutes.

Hidekazu discloses a ceramic coating, more precisely, ZrO_2 ceramic spray coating on the surface of a heat-resistant member followed by laser irradiation to densify the surface of the ceramic coating. However, Hidekazu is silent regarding any color change. Applicants note that the surface of ceramic ZrO_2 coating is not blackened by laser irradiation.

Takeshi discloses a method for sealing pores of metallic or ceramic thermally spray-coated films. However, Takeshi does not disclose Y_2O_3 as a coating material and does not disclose any color change during the process.

Hanagata discloses a method wherein a substrate is immersed in an aqueous solution and irradiated with a laser to form a ceramic film on the irradiated portion, which is not a method of melting and densifying a coating by laser irradiation.

Morris relates to the preparation of highly oxidized superconductors in a highly oxidizing atmosphere. While Morris is replete with various oxide composites such as $RBa_2Cu_4O_8$, there is no disclosure regarding Y_2O_3 coatings.

As for rejection (a), the Office Action combines Harada with Maeda and Tsukuda and asserts that all three documents render claims 1-5, 7, 8, 11-15, and 17 obvious. This rejection is respectfully traversed.

The Examiner is reminded that “[a] patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art. Although common sense directs one to look with care at a patent application that claims as innovation the combination of two known devices according to their established functions, it can be important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does.” *KSR Int’l Co. v. Teleflex Inc.*, 127 S. Ct., 1741.

Applicants again submit that the Examiner has failed to identify any reason that would have prompted a person of ordinary skill in the art to provide a reason to (i) combine Harada with Maeda, or (ii) assuming that the combination of Harada and Maeda is proper, why would one of ordinary skill then be motivated to further combine with Tsukuda.

Applicants respectfully submit that there is nothing in Harada that would prompt the skilled artisan to further search for “a Y_2O_3 black spray coating” as recited in present claim 1. Applicants respectfully submit that Harada is silent regarding the color of the Y_2O_3 coating. Furthermore, there is no discussion on Harada that would prompt the skilled artisan that a Y_2O_3 coating of a different color, not to mention blackened Y_2O_3 , is

desirous. In the absence of such rational underpinning to support the combination of the documents, one of ordinary skill would not further seek any documents to find support for at least the herein-discussed the missing recitation. Thus, the obviousness rejection is improper.

Assuming however, *arguendo*, that Harada provides a reason to combine this document with secondary references, then Applicants respectfully submit that the skilled artisan would not combine Harada with Maeda. As recited in Harada, paragraph [0019] of the machine translation, metal impurities, such as Fe, Mg, Cr, Al, Ni, or Si are not favored due to a detrimental effect on the desired erosion stability. Applicants submit that this preferred absence of metals and other materials would prevent the skilled artisan to combine Harada with Maeda because Maeda discloses an intentional mixing of Y_2O_3 coating material with carbon, titanium and molybdenum. Therefore, the hypothesized combination of Harada and Maeda would not have any expectation of success.

In view of the foregoing Applicants submit that Harada does not provide any reason that would prompt a skilled artisan to combine with any secondary documents. Furthermore, even if combined with Maeda as a secondary reference, the combination would not have any expectation of success. Therefore, withdrawal of rejection (a) is respectfully requested.

Furthermore, with respect to method claims 11-15, and 17 and in view of the foregoing amendment to the claims, Applicants respectfully submit that neither Harada

nor Maeda nor Tsukuda disclose or render obvious "an electron beam is irradiated . . . to form blackened Y_2O_3 " as recited in independent method claim 10, from which claims 11-15 and 17 are dependent. For this reason as well, withdrawal of rejection (a) is respectfully requested.

As for rejection (b), Applicants respectfully submit that the Office Action does not fully explain how Borglum, Hidekazu, Takeshi, and Hanagata present a *prima facie* obviousness type rejection of claims 1 and 10, which are parent to presently rejected claims 6 and 16.

Assuming that the Examiner intended to combine the documents of rejection (b) with Harada, Maeda and Tsukuda as raised in rejection (a), Applicants respectfully maintains the traverse regarding the propriety of combining Harada, Maeda and Tsukuda and further submits that extension of these combinations to Borglum, Hidekazu, Takeshi, and Hanagata does not resolve the raised issues regarding the propriety of the combination of Harada with any other documents.

If a combination of the documents in rejection (b) with the documents of rejection (a) was not desired by the Examiner, Applicants respectfully request how the documents of rejection (b) render parent claims 1 and 10 obvious. Otherwise, withdrawal of rejection (b) is respectfully requested in view of the foregoing.

As for rejection (c), Applicants respectfully submit that the rejection of claim 9 is moot in view of the cancellation of this claim. With respect to the rejection of claim 10, Applicants submit as stated above, that the combination of Harada, Maeda, and Tsukuda is not proper. Furthermore, even assuming, *arguendo*, that the combination would be proper, Applicants submit that Morris would not cure the deficiency of the combined documents for the rejection of claim 10. In particular, Applicants submit that Morris does not disclose "an electron beam is irradiated under a low pressure or in an inert gas atmosphere under a low pressure to form blackened Y_2O_3 " as recited in claim 10. As a matter of fact, there is no disclosure of any electron beam irradiation in Morris. Secondly, Morris does not disclose any irradiation at low pressure or inert gas atmosphere. In fact, Morris discloses mostly reactions at high pressures in an oxygen atmosphere. Thirdly, there is no disclosure of any change of color of Y_2O_3 as a result of the teachings in Morris. Therefore, even assuming, *arguendo*, that the underlying combination of documents would be proper, Morris still does not render claim 10 obvious. Accordingly, withdrawal of this rejection is respectfully requested.


Because, the cited documents either alone or in combination fail to disclose all the recitations of the claimed invention, obviousness is not established as the obviousness rejections fail to disclose or suggest all recitations of the claims. Withdrawal of the rejections is respectfully requested.

Conclusion

In view of the foregoing, it is believed that all of the claims in this application are in condition for allowance, which action is respectfully requested. If any issues yet remain which can be resolved by a phone conference, the Examiner is respectfully invited to contact the undersigned at the telephone number below.

If there should be any questions or if any issues remain that can be resolved by telephone, the Examiner is respectfully invited to contact the undersigned at the telephone number listed below.

Respectfully submitted,
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